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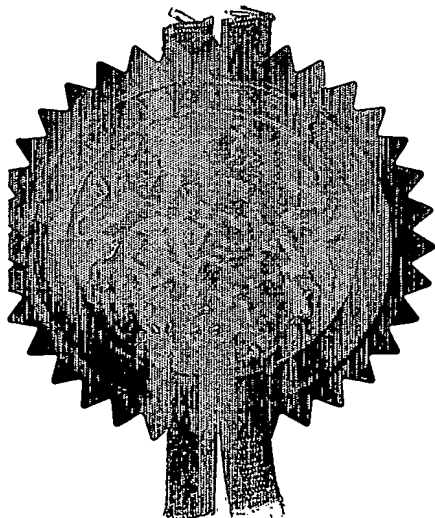
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

Dated

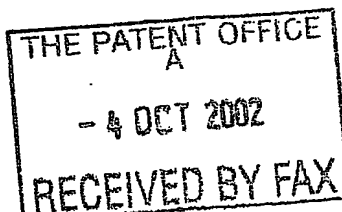
10 November 2003

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## Patents Form 1/77

Patents Act 1977  
(Rule 16)The  
**Patent  
Office**

1/77

**Request for grant of a patent***(See the notes on the back of this form. You can also  
get an explanatory leaflet from the Patent Office in  
help you fill in this form)*

The Patent Office

Cardiff Road  
Newport  
South Wales  
NP9 1RH

1. Your reference

P/63781-GBA/VISB

45795

2. Patent application number  
*(The Patent Office will fill in this part)*

0222990.4

P/63781-GBA/VISB

1/7700 0.00-0222990.4 04 OCT 2002

3. Full name, address and postcode of the or of  
each applicant *(underline all surnames)*E2V Technologies Limited  
106 Waterhouse Lane  
Chelmsford  
Essex  
CM1 2QU

8457749001

Patents ADP number *(if you know it)*If the applicant is a corporate body, give the  
Country/state of its incorporation

United Kingdom

4. Title of the invention

SOLID STATE IMAGING DEVICE

5. Name of your agent *(if you have one)*

N. Hucker

"Address for service" in the United Kingdom  
to which all correspondence should be sent  
*(including the postcode)*Marconi Intellectual Property  
Marrable House  
The Vineyards  
Great Baddow  
Chelmsford  
Essex CM2 7DSReddie + Grosse  
16 Theobalds Rd  
LONDON  
WC1X 8PLPatents ADP number *(if you know it)*

787350000Z

01001

Please see A/L 02/02/03 DW

6. If you are declaring priority from one or more  
earlier patent applications, give the country  
and the date of filing of the or of each of these  
earlier applications and *(if you know it)* the or  
each application number

Country

Priority application number  
*(if you know)*Date of filing  
*(day / month / year)*7. If this application is divided or otherwise  
derived from an earlier UK application,  
give the number and the filing date of  
the earlier application

Number of earlier application

Date of filing  
*(day / month / year)*8. Is a statement of inventorship and of right  
to grant of a patent required in support of  
this request? *(Answer "Yes" if:*

YES

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

Patents Form P1/77

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## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	(0)
Description	2
Claim(s)	(0)
Abstract	(0)
Drawings	(0)

10. If you are also filing any of the following, state how many against each item.

Priority documents	(0)
Translations of priority documents	(0)
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	(0)
Request for preliminary examination and search (Patents Form 9/77)	(0)
Request for substantive examination (Patents Form 10/77)	(0)
Any other documents (please specify)	

11. I/We request the grant of a patent on the basis of this application.

Signature Nerys Hucker Date 04/10/02

12. Name and daytime telephone number of person to contact in the United Kingdom

Nerys Hucker  
01245 493 493 ext.3122

**Warning**

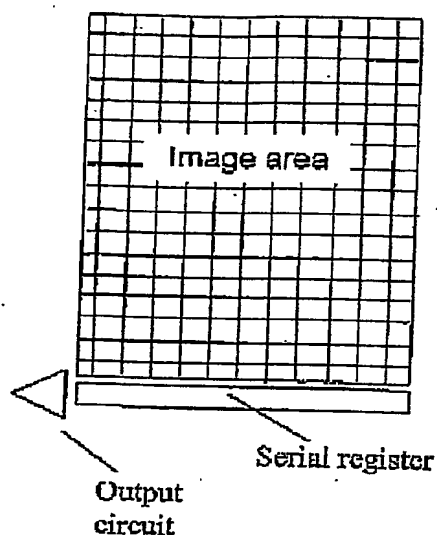
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P/6378 GBA/VISD

## NEW PATENT APPLICATION

**Method for controlled injection of small quantity of charge into a CCD.**

The general format of an imaging CCD is well known and is shown, by way of example, in the diagram below.



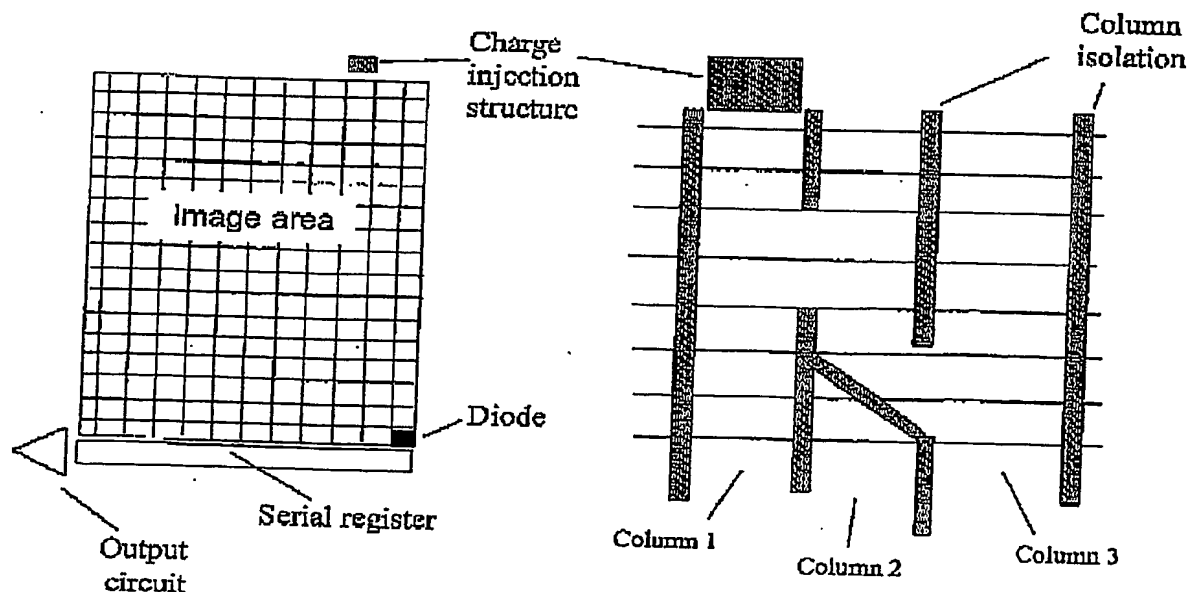
A requirement sometimes exists to provide a metered charge input to the serial register at the end of the register remote from the output circuit. This can be used for a variety of purposes, for example :

1. Calibration of the output circuit.
2. As a "fat zero" for mitigation of the effects of proton or neutron damage.

In many of these applications, injected charge will only be required in a small number of register elements for each line read, but should be available for all line reads.

Well known techniques are available to inject this charge, the most commonly used being some variant of the "fill and spill" technique. It is, however, very difficult to controllably inject an amount of charge less than around 10,000 electrons.

As an alternative to periodically injecting charge directly into the serial register, it is proposed that charge be injected at the top of the image area, as shown in the diagram below. In this case, as charge is injected into the top row



P/6374. GBA/VIS

in one column of the image. As lines are transferred down through the CCD in the normal operation of the device, charge is again injected into the top line and is transferred down through the CCD and appears in the end of the register remote from the output circuit.

Within the column isolation structure in the image area, associated with the transfer of this injected charge, charge is injected into column 1. By omission of the isolation between columns 1 & 2, charge is allowed to spread across the two columns. When isolation is re-established, the charge is then divided in proportion to the storage areas of pixels in the two columns. Column 2 then includes an isolation region which causes all charge to be shifted across into column 3. The structure described above is repeated several times down the height of the image area, producing a charge division each time. By this method, the charge in column 1 can be reduced to a very low level and this level transferred into the serial register. Excess charge is transferred down column 3, from where it can be lost by transfer into a dump diode.

P.J.Pool  
R.T.Bell

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